WBS	Name	Cost	M&S	Labor	M&S Cont.	Labor Cont	Level
1.1	**Run 2b Silicon Project**	**$12,374,885**	**$8,177,995**	**$4,205,812**	**0**	**0**	**0**

Notes

WBS Definition -
This is the upgrade Silicon Detector for CDF RunIIb.
These tables summarize the number of major components for the project.

Layer	Type	φ-seg.	Z-seg.	Length	Width	Pitch	Total
5	A	30	6	96.4	40.5	75/37.5	360
5	A	30	6	96.4	40.5	75/37.5	360
4	A	24	6	96.4	40.5	75/37.5	288
4	1.2°	24	6	96.4	43.1	80/40	288
3	A	18	6	96.4	40.5	75/37.5	216
3	1.2°	18	6	96.4	43.1	80/40	216
2	A	12	6	96.4	40.5	75/37.5	144
2	1.2°	12	6	96.4	43.1	80/40	144
1	A	6	6	96.4	40.5	75/37.5	72
1	A	6	6	96.4	40.5	75/37.5	72
0	A	12	6	96.4	14.8	50/25	144

	Sensors	Modules	Staves	4-chips hybrids	2-chips hybrids	MPC	JPC
Outer Axials	1512	756	180	1080	0	180	40
Outer Stereo	648	324					
L0	144	72	0	0	72	0	16
TOTAL	**2304**	**1152**	**180**	**1080**	**72**	**180**	**56**

WBS	Name	Cost	M&S	Labor	M&S Cont.	Labor Cont	Level
1.1.1	**Administration**	**$315,716**	**$5,000**	**$349,076**	**0**	**0**	**0**

Notes

WBS Definition -
Administration costs for the project

M&S BOE -

Labor BOE -

WBS	Name	Cost	M&S	Labor	M&S Cont.	Labor Cont	Level
1.1.1.1	Level 2 Project managers	$0	$0	$0	0	0.1	0

ID	*Resource Name*	*Units*	*Work*	*Delay*	*Start*	*Finish*	*Cost*	*Baseline Cost*	*Act. Cost*	*Rem. Cost*
10	*Physicist*	*200%*	*64 hrs*	*0 days*	*Mar 3 '03*	*Mar 6 '03*	*$0*	*$0*	*$0*	*$0*

WBS	Name	Cost	M&S	Labor	M&S Cont.	Labor Cont	Level

"Level 2 Project managers" continued

Notes

WBS Definition -
This is the labor associated with the L2 Project Managers

M&S BOE -

Labor BOE -
This accounts for the time of the Silicon Project managers.

1.1.1.2	Level 3 Project managers	$219,996	$0	$247,156	0	0.1	0

ID	Resource Name	Units	Work	Delay	Start	Finish	Cost	Baseline Cost	Act. Cost	Rem. Cost
10	Physicist	100%	6,480 hrs	0 days	Mar 3 '03	May 19 '06	$0	$0	$0	$0
17	ElecEngF	20%	1,296 hrs	0 days	Mar 3 '03	May 19 '06	$71,280	$71,280	$0	$71,280
20	MechEngSF	45%	2,916 hrs	0 days	Mar 3 '03	May 19 '06	$148,716	$148,716	$0	$148,716

Notes

WBS Definition -
This accounts for the time of the Level 3 project managers.

M&S BOE -

Labor BOE -
We anticipate that they will need to spend 20% each of an FTE on managerial tasks
over the duration of the project.
There are 5 level 3 managers and each one will include a physicist. Total 100%
We have an electrical engineer to oversee the DAQ half of the project
and 3 mechanical engineers to oversee the mechanical part of the project - one is dedicated to the production of modules and staves, the 2nd is dedicated to the barrel assembly and installation.
Each of these will take 20% on managerial tasks.
We have an additional mech engineer for the cooling system cooling. This is a small task and will only require 5% of an engineer for managerial duties.

1.1.1.3	Integration meetings	$90,720	$0	$101,920	0	0.1	0

ID	Resource Name	Units	Work	Delay	Start	Finish	Cost	Baseline Cost	Act. Cost	Rem. Cost
10	Physicist	50%	3,240 hrs	0 days	Mar 3 '03	May 19 '06	$0	$0	$0	$0
11	Postdoc	100%	6,480 hrs	0 days	Mar 3 '03	May 19 '06	$0	$0	$0	$0
17	ElecEngF	10%	648 hrs	0 days	Mar 3 '03	May 19 '06	$35,640	$35,640	$0	$35,640
20	MechEngSF	10%	648 hrs	0 days	Mar 3 '03	May 19 '06	$33,048	$33,048	$0	$33,048
22	MechTechSF	10%	648 hrs	0 days	Mar 3 '03	May 19 '06	$22,032	$22,032	$0	$22,032

1.1.1.4	Software support for parts database	$5,000	$5,000	$0	1	0.1	0

ID	Resource Name	Units	Work	Delay	Start	Finish	Cost	Baseline Cost	Act. Cost	Rem. Cost
7	MANDS	5,000	5,000	0 days	Aug 13 '03	Mar 31 '06	$5,000	$5,000	$0	$5,000
11	Postdoc	50%	2,640 hrs	0 days	Aug 13 '03	Mar 31 '06	$0	$0	$0	$0

Notes

WBS Definition -

WBS	Name	Cost	M&S	Labor	M&S Cont.	Labor Cont	Level

"Software support for parts database" continued

Notes

This item covers the development of the software to track all the production parts in Run IIa.
It requires some time to setup before the production parts arrive, and then will require attention for the entering of data as the parts come in.

M&S BOE -
Physicist estimate based on Run IIa experience.
Cost is for software packages.

Labor BOE -
Based on Run IIa experience

WBS	Name	Cost	M&S	Labor	M&S Cont.	Labor Cont	Level
1.1.2	**DAQ**	**$5,770,275**	**$4,876,460**	**$856,233**	**0**	**0**	**0**

Notes

WBS Definition -
This is all the electrical part of the schedule.
It covers:

Item	Number of Parts
Svx4 chip	4464
Transceiver chip (TRX25)	792
Hybrid 4-chips (Outer)	1080
Hybrids 2-chips (L0)	72
Mini-Port Cards (MPC)	180
Bus Cables	360
Junction Port Cards (JPC)	52
L0 Analogue Signal Cables	144
Fiber Transition Modules (FTM)	26
Power Supplies	440HV,572LV
Cables (JPC-crates)	52 sets
Cables (MPC-JPC)	180 sets
DAQ Test&Readiness	

M&S BOE -

Labor BOE -

WBS	Name	Cost	M&S	Labor	M&S Cont.	Labor Cont	Level
1.1.2.1	SVX4 Chips	$886,538	$758,390	$110,548	0	0	0

Notes

WBS Definition -
This is the readout chip for the silicon sensors.

Runs:
1. Prototype (Hybrid #1)
2. Contingency (Hybrid #2)
3. Production (Preproduction and Production hybrids)

Need **4,464** chips for the project

M&S BOE -

Labor BOE -

WBS	Name	Cost	M&S	Labor	M&S Cont.	Labor Cont	Level
1.1.2.2	Transceiver Chips	$171,670	$128,000	$43,670	0	0	0

Notes

WBS Definition -
A new transceiver chip in 0.25um technology (same as the SVX4) is needed in order to minimize the power consumption at the mini-portcard level and the number of independent power supply lines needed for the project (we completely drop the 5V supply line for the mini-PC). The new transceiver chip is only 2.52x2.88 mm^2.

The backup solution is to re-use the old Honeywell 0.85um rad-hard transceiver chip. These old chips are available in quantity sufficient to cover the needs of this project. The mini-portcard prototype#1 uses the old chip. The new chip should be available for the 2nd mini-portcard round and for all the L0 hybrids.

The mini-portcard needs 4 new transceiver chip (or 5 old ones). The L0 hybrid needs 1 transceiver chip (either old or new).

M&S BOE -
Total number of transceiver chips needed (new) is 180*4+72 = **792**.

Labor BOE -

WBS	Name	Cost	M&S	Labor	M&S Cont.	Labor Cont	Level
1.1.2.3	Hybrids	$1,685,841	$1,590,841	$95,000	0	0	0

Notes

WBS Definition -
BeO hybrid for Silicon Readout. There are 2 kinds of hybrids:
Outer Detector Hybrids (4-chips) and L0 hybrids (2-chips).

M&S BOE -
The Outer Detector Hybrid is a BeO substrate (2cmx3.9cm). Included in the hybrids are:
1. 4 SVX4 chips.
2. miscellaneous components (capacitors, resistors, thermistor).
3. pitch adapters
4. testing boards

Runs (4 chips hybrids):
1. Prototype#1 (milestone #1 "electrical stave test")

WBS	Name	Cost	M&S	Labor	M&S Cont.	Labor Cont	Level

"Hybrids" continued

Notes

2. Protoype#2-Contingency (milestone #2 "contingency electrical stave test")
3. Preproduction (milestone #3 "preproduction electrical stave test")
4. Production (milestone #4 "Production electrical stave test")

Need **1,080** 4-chips hybrids

The L0 Hybrid is a BeO substrate (2cmx3.9cm). Included in the L0 hybrids are:
1. 2 SVX4 chips.
2. miscellaneous components (capacitors, resistors, thermistor).
3. 1 Transceiver chip
4. 2 Kapton pig tails

Runs (L0 hybrids):
1. Prototype#1
2. Production

Need **72** 2-chips hybrid for the project

Labor BOE -

1.1.2.4	L0 analog signal cables	$391,022	$325,937	$58,183	0	0	0

Notes

WBS Definition -

M&S BOE -

Labor BOE -

1.1.2.5	Bus Cables	$43,386	$43,386	$0	0	0	0

Notes

WBS Definition -
Outer layer Bus cable is a Kapton based cable with signal and power traces to electrically connect the mini-PC to the hybrids. It also provides a ground shield plate to minimize noise pick-up from the sensors and the sensor bias connection.

Runs:
1. Prototype (milestone #1 "electrical stave test")
2. Preproduction (milestone #3 "Preproduction electrical stave test")
3. Production (milestone #4 "Production electrical stave test")

M&S BOE -
Need **360** bus cables for the 180 staves installed. We will construct 200 Staves to include 20 spares and thus will need 400 Bus cables.

Labor BOE -
All LBL labor. No FNAL efforts for the Bus Cable.

WBS	Name	Cost	M&S	Labor	M&S Cont.	Labor Cont	Level
1.1.2.6	**Mini Port Card**	**$585,270**	**$362,936**	**$205,104**	**0**	**0**	**0**

Notes

WBS Definition -
The MPC is a BeO hybrid (2"x1.55"). Included in the MiniPortcards are:
1. components (including transceiver chips), connectors etc.
2. short Kapton cables (2 cables, one for power and one for data)
3. cable wing (one Kapton cable that connects the top MPC to the bottom stave bus cable)

Runs:
1. Prototype (milestone #1 "electrical stave test")
2. Contingency (milestone #2 "contingency electrical stave test")
3. Preproduction (milestone #3 "preproduction electrical stave test")
4. Production (milestone #4 "Production electrical stave test")

M&S BOE -
Need **180** Mini Port Cards for the project.

Labor BOE -

WBS	Name	Cost	M&S	Labor	M&S Cont.	Labor Cont	Level
1.1.2.7	**Junction Port Cards**	**$262,558**	**$150,000**	**$112,558**	**0**	**0**	**0**

Notes

WBS Definition -
The JPC is an FR4 board for signal and power distribution. JPC includes the components such as capacitors, resistors, power filters, FPGA, connectors etc. and the Runs as follows:
1. Prototype#1 (milestone#1 "prototype electrical stave test")
2. Prototype#2 - contingency
3. Preproduction (milestone#3 "preproduction electrical stave test")
4. Production (milestone#4 "production electrical stave test")

Each port card can serve up to 5 mini-PC.

M&S BOE -
Total number of JPC for the project (including L0) is **54.**

Labor BOE -

WBS	Name	Cost	M&S	Labor	M&S Cont.	Labor Cont	Level
1.1.2.8	**Cables**	**$488,906**	**$435,816**	**$53,090**	**0**	**0**	**0**

Notes

WBS Definition -
We will replace all cables going from the silicon detector to the DAQ and Power Supplies racks.
There are 2 sets of these cables:
- from the mini Port Card (end of stave) to the Junction Port Card
- from the Junction Port Card to the racks (FTM and Power Supplies)

M&S BOE -

Labor BOE -

WBS	Name	Cost	M&S	Labor	M&S Cont.	Labor Cont	Level
1.1.2.9	**Fiber Transition Module Replacements**	**$266,868**	**$165,500**	**$101,368**	**0**	**0**	**0**

Notes

WBS Definition -
Fiber Transition Modules. These boards are part of the upper DAQ system and are the interface to the JPC. There are 2 JPC per FTM. New boards are needed to replace the Fiber Transition Modules (FTMs) because we are not using optical transmitter/receivers for the data.

M&S BOE -
Here we estimate the price of making a totally new card.
There are 52 JPC's installed the project.
There is one FTM every 2 JPC = 26 FTMs.
We need to have spares and extra boards for test stands: need 36 total FTMs (6 spares + 4 for DAQ test stands)
Runs:
1. Prototype
2. Preproduction
3. Production

Labor BOE -

1.1.2.10	**DAQ Testing & Readiness**	**$291,200**	**$262,400**	**$28,800**	**0**	**0**	**0**

Notes

WBS Definition -
The upper data acquisition system will not change with respect to Run IIa. The lower data acquisition chain includes new pieces:
svx4 chip, miniPC, JPC and FTM.

These are all tests needed to assure proper functionality of the new pieces in the overall DAQ scheme. Includes the hardware necessary to perform these tests and all other electrical tests aimed at establishing good and reliable DAQ performance. It also includes the possible upgrade and obsolescent part procurement for the Upper DAQ system (FIB, VRB and SCR).

M&S BOE -

Labor BOE -

1.1.2.11	**Power Supply system**	**$697,016**	**$653,254**	**$47,912**	**0**	**0**	**0**

Notes

WBS Definition -
Power supply system for the Staves, JPC and L0 (Low and High voltages). We need a new power supply system in order to provide power to the detector. The power distribution per stave is 1 AVDD, 1 DVDD and 2 High Voltages. Power distribution for L0 is 1 AVDD, 1DVDD and 1 HV per module. The Junction Port Card needs a separate 5V line per JPC. Channel count for the above scheme is provided in the table.

M&S BOE -

Labor BOE -

WBS	Name	Cost	M&S	Labor	M&S Cont.	Labor Cont	Level
1.1.3	Sensors	$1,661,768	$1,612,728	$49,040	0	0	0

Notes

WBS Definition -

M&S BOE -

The table below summarizes the type and number of sensors needed:

Silicon Sensors

Layer	Type	Φ-seg.	Z-seg.	Length	Width	Pitch	Total
5	A	30	6	96.4	40.5	75/37.5	360
5	A	30	6	96.4	40.5	75/37.5	360
4	A	24	6	96.4	40.5	75/37.5	288
4	2.5°	24	6	96.4	43.1	80/40	288
3	A	18	6	96.4	40.5	75/37.5	216
3	2.5°	18	6	96.4	43.1	80/40	216
2	A	12	6	96.4	40.5	75/37.5	144
2	2.5°	12	6	96.4	43.1	80/40	144
1	A	6	6	96.4	40.5	75/37.5	72
1	A	6	6	96.4	40.5	75/37.5	72
0	A	12	6	96.4	14.8	50/25	144

	Sensors Quantity	Total (+ 20% spares)
Outer Axials	1512	1814
Outer Stereo	648	778
L0	144	172
TOTAL	2304	2764

Labor BOE -

WBS	Name	Cost	M&S	Labor	M&S Cont.	Labor Cont	Level
1.1.3.1	Outer layers	$1,565,011	$1,521,619	$43,392	0	0	0

Notes

WBS Definition -

We are going to prototype the outer stereo and Axial sensors.

WBS	Name	Cost	M&S	Labor	M&S Cont.	Labor Cont	Level
"Outer layers" continued							

Notes

Runs:
1. Prototypes Axials and Small Angle Stereo (30 grade "A"+30 grade "B" each)
2. Production (Axials, SAS and L0)
3. Purchase leftover L00 sensors (same design as used in Run IIa is used for Run IIb)

M&S BOE -

Labor BOE -

1.1.3.2	**Layer 0**	**$96,757**	**$91,109**	**$5,648**	**0**	**0**	**0**

Notes

WBS Definition -

M&S BOE -

Labor BOE -

1.1.4	**Cooling and Monitoring**	**$354,304**	**$240,000**	**$114,304**	**0**	**0**	**0**

Notes

WBS Definition -
This task covers the cooling system, the monitoring of the cooling and power to the detectors and the position monitors (RASNIKS). 50% contingency is included on all costed items.

M&S BOE -

Labor BOE -

1.1.4.1	**Cooling system SiDet**	**$43,392**	**$20,000**	**$23,392**	**0**	**0**	**0**

Notes

WBS Definition -
This task covers updating the cooling system at SiDet and B0 and the cost of new manifolds at the detector.

M&S BOE -

Labor BOE -

1.1.4.2	**Cooling Manifolds and chiller components**	**$141,568**	**$60,000**	**$81,568**	**0**	**0**	**0**

Notes

WBS Definition -

M&S BOE -

WBS	Name	Cost	M&S	Labor	M&S Cont.	Labor Cont	Level
"Cooling Manifolds and chiller components" continued							
	Notes Labor BOE -						
1.1.4.3	**Interlocks**	**$100,000**	**$100,000**	**$0**	**0**	**0**	**0**
	Notes WBS Definition - This is the system that monitors the power and temperature of the detectors. It will re-use most of the existing system. M&S BOE - Labor BOE -						
1.1.4.4	**Position Monitoring**	**$20,000**	**$20,000**	**$0**	**0**	**0**	**0**
	Notes WBS Definition - This is to update the existing position monitoring system (RASNIK). M&S BOE - Cost is based on Run IIa experience and reusing the DAQ already setup. Labor BOE - There is no FNAL labor for this task, Toronto is taking on this entire project.						
1.1.4.5	**Radiation Monitoring**	**$49,344**	**$40,000**	**$9,344**	**0**	**0**	**0**
	Notes WBS Definition - M&S BOE - Labor BOE -						
1.1.5	**Construction of Modules, Staves and L0**	**$1,925,884**	**$592,700**	**$1,333,184**	**0**	**0**	**0**
	Notes WBS Definition - Need 180 staves, 1080 modules for the outer 72 modules for L0. M&S BOE - Labor BOE -						

WBS	Name	Cost	M&S	Labor	M&S Cont.	Labor Cont	Level
1.1.5.1	Beginning of Mechanical Project	$0	$0	$0	0	0	4

Notes
WBS Definition -
This task marks the end of the conceptual work and the beginning of the specific realization of mechanical parts.

M&S BOE -

Labor BOE -

WBS	Name	Cost	M&S	Labor	M&S Cont.	Labor Cont	Level
1.1.5.2	**L0 Module Construction**	**$206,136**	**$69,600**	**$136,536**	**0**	**0**	**0**

Notes
WBS Definition -
Required quantity for the L0 detector is 72 modules. We should schedule and cost 100 production modules based on the L00 experience. Modules are formed by 2 sensors glued "head-on", a pair of Kapton cables (analogue cable) and one 2-chips L0 hybrid.

M&S BOE -

Labor BOE -

WBS	Name	Cost	M&S	Labor	M&S Cont.	Labor Cont	Level
1.1.5.3	**Outer layer modules**	**$574,664**	**$130,600**	**$444,064**	**0**	**0**	**0**

Notes
WBS Definition -
It consists of 2 sensors glued together "head-on". On top of one sensor one hybrid and one pitch adapter is also glued. Module is wirebonded and put on a G-10 frame for testing.

M&S BOE -
Need **882** modules for the project.

Labor BOE -

WBS	Name	Cost	M&S	Labor	M&S Cont.	Labor Cont	Level
1.1.5.4	**Outer layer Staves**	**$1,145,084**	**$392,500**	**$752,584**	**0**	**0**	**0**

Notes
WBS Definition -

M&S BOE -

Labor BOE -

WBS	Name	Cost	M&S	Labor	M&S Cont.	Labor Cont	Level
1.1.6	**Support Mechanics**	**$2,346,930**	**$851,100**	**$1,503,974**	**0**	**0**	**0**

Notes
WBS Definition -
This section covers infrastructure, the support structures for the staves, barrels, L0, and transportation and installation at B0.

WBS	Name	Cost	M&S	Labor	M&S Cont.	Labor Cont	Level
"Support Mechanics" continued							

Notes

M&S BOE -
50% cont. is included on all costed items.

Labor BOE -

1.1.6.1	**Silicon Support Structures**	**$1,236,725**	**$526,000**	**$718,869**	**0**	**0**	**0**

Notes

WBS Definition -
This task covers the bulkheads which support the staves, the screens which attach the bulkheads to each other, the tube which supports the barrels (spacetube in Run IIa) and the support structure for L0.

M&S BOE -

Labor BOE -

1.1.6.2	**Integration Fixtures**	**$444,732**	**$148,000**	**$296,732**	**0**	**0**	**0**

Notes

WBS Definition -
This task includes the fixtures and labor associated with installing the inner detector (L0) into the outer barrel. All costs and labor are estimated based on Run IIa experience.

M&S BOE -

Labor BOE -

1.1.6.3	**Final Assembly (Stave Installation, L0 module inst.)**	**$567,793**	**$177,100**	**$390,693**	**0**	**0**	**0**

Notes

WBS Definition -
This task covers installation of staves into the barrels, installation of L0 modules on the CF supports and the integration of L0 and beampipe with the outer barrel.

M&S BOE -

Labor BOE -

1.1.6.4	**Detector Integration**	**$97,680**	**$0**	**$97,680**	**0**	**0**	**0**

Notes

WBS Definition -

M&S BOE -

Labor BOE -

WBS	Name	Cost	M&S	Labor	M&S Cont.	Labor Cont	Level
"Detector Integration" continued							
	Notes						
1.1.7	**Italy Buy Backs**	**$3**	**$3**	**$0**	**0**	**0**	**0**
	Notes WBS Definition - M&S BOE - Labor BOE -						
1.1.7.1	I-BB- on 1st chip layout	$1	$1	$0	0	0	0

ID	Resource Name	Units	Work	Delay	Start	Finish	Cost	Baseline Cost	Act. Cost	Rem. Cost
2	FNALR&D	0%	0 hrs	0 days	Feb 8 '02	Feb 8 '02	($24,999)	($24,999)	($24,999)	$0
3	Italy EQ	0%	0 hrs	0 days	Feb 8 '02	Feb 8 '02	$25,000	$25,000	$25,000	$0

Notes
WBS Definition -

M&S BOE -

Labor BOE -

1.1.7.2	I-BB on Production SVX4 chip manufacturing	$1	$1	$0	0	0	0

ID	Resource Name	Units	Work	Delay	Start	Finish	Cost	Baseline Cost	Act. Cost	Rem. Cost
1	FNALEQ	0%	0 hrs	0 days	Oct 8 '03	Oct 8 '03	($99,999)	($99,999)	$0	($99,999)
3	Italy EQ	0%	0 hrs	0 days	Oct 8 '03	Oct 8 '03	$100,000	$100,000	$0	$100,000

Notes
WBS Definition -

M&S BOE -

Labor BOE -

1.1.7.3	I-BB on Power Supplies Procurement	$1	$1	$0	0	0	0

ID	Resource Name	Units	Work	Delay	Start	Finish	Cost	Baseline Cost	Act. Cost	Rem. Cost
1	FNALEQ	0%	0 hrs	0 days	Sep 22 '04	Sep 22 '04	($131,999)	($131,999)	$0	($131,999)
3	Italy EQ	0%	0 hrs	0 days	Sep 22 '04	Sep 22 '04	$132,000	$132,000	$0	$132,000

WBS	Name	Cost	M&S	Labor	M&S Cont.	Labor Cont	Level

"I-BB on Power Supplies Procurement" continued

Notes

WBS Definition -

M&S BOE -

Labor BOE -

WBS	Name	Cost	M&S	Labor	M&S Cont.	Labor Cont	Level
1.1.8	**Japan Buy Backs**	**$4**	**$4**	**$0**	**0**	**0**	**0**

Notes

WBS Definition -

M&S BOE -

Labor BOE -

WBS	Name	Cost	M&S	Labor	M&S Cont.	Labor Cont	Level
1.1.8.1	J-BB on prototype sensors manufacturing	$1	$1	$0	0	0	0

ID	*Resource Name*	*Units*	*Work*	*Delay*	*Start*	*Finish*	*Cost*	*Baseline Cost*	*Act. Cost*	*Rem. Cost*
2	*FNALR&D*	*0%*	*0 hrs*	*0 days*	*Mar 1 '02*	*Mar 1 '02*	*($96,672)*	*($96,672)*	*($96,672)*	*$0*
9	*INKIND*	*96,673*	*96,673*	*0 days*	*Mar 1 '02*	*Mar 7 '02*	*$96,673*	*$96,673*	*$96,673*	*$0*

Notes

WBS Definition -

M&S BOE -

Labor BOE -

WBS	Name	Cost	M&S	Labor	M&S Cont.	Labor Cont	Level
1.1.8.2	J-BB on production sensors manufacturing I	$1	$1	$0	0	0	0

ID	*Resource Name*	*Units*	*Work*	*Delay*	*Start*	*Finish*	*Cost*	*Baseline Cost*	*Act. Cost*	*Rem. Cost*
1	*FNALEQ*	*0%*	*0 hrs*	*0 days*	*Mar 3 '03*	*Mar 3 '03*	*($378,326)*	*($378,326)*	*$0*	*($378,326)*
9	*INKIND*	*378,327*	*378,327*	*0 days*	*Mar 3 '03*	*Mar 7 '03*	*$378,327*	*$378,327*	*$0*	*$378,327*

Notes

WBS Definition -

M&S BOE -

Labor BOE -

WBS	Name	Cost	M&S	Labor	M&S Cont.	Labor Cont	Level
1.1.8.3	J-BB on production sensors manufacturing II	$1	$1	$0	0	0	0

ID	Resource Name	Units	Work	Delay	Start	Finish	Cost	Baseline Cost	Act. Cost	Rem. Cost
1	FNALEQ	0%	0 hrs	0 days	Mar 1 '04	Mar 1 '04	($221,865)	($221,865)	$0	($221,865)
9	INKIND	221,866	221,866	0 days	Mar 1 '04	Mar 5 '04	$221,866	$221,866	$0	$221,866

Notes

WBS Definition -

M&S BOE -

Labor BOE -

1.1.8.4	J-BB on L0 production sensors manufacturing	$1	$1	$0	0	0	0

ID	Resource Name	Units	Work	Delay	Start	Finish	Cost	Baseline Cost	Act. Cost	Rem. Cost
1	FNALEQ	0%	0 hrs	0 days	Mar 1 '04	Mar 1 '04	($85,058)	($85,058)	$0	($85,058)
9	INKIND	85,059	85,059	0 days	Mar 1 '04	Mar 5 '04	$85,059	$85,059	$0	$85,059

Notes

WBS Definition -

M&S BOE -

Labor BOE -

1.1.9	**Level 1 Milestones**	**$0**	**$0**	**$0**	**0**	**0**	**0**
1.1.9.17	Production Modules Available	$0	$0	$0	0	0	1
1.1.9.18	Outer detector Complete	$0	$0	$0	0	0	1